Assignment

1. State the domain and range of each relation.

a) (2, 3), (0, 2), (4, 8), (–1, 8), (–3, 1)

b) (–3, 3), (0, –5), (–3, 3), (5, –2), (–8, 1)

c)

Input (x)	Output (y)
0	3
2	4
4	5
6	3

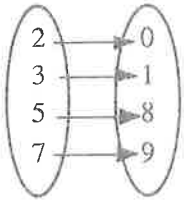
d)

Input (x)	Output (y)
2	3
0	4
–3	5
2	6

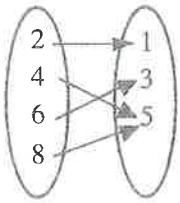
e)

Input (x)	Output (y)
1	5
–1	5
3	5
7	5

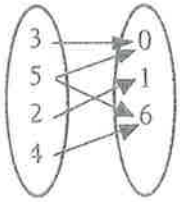
f)



g)

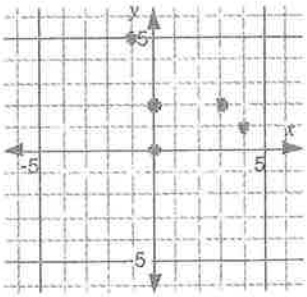


h)

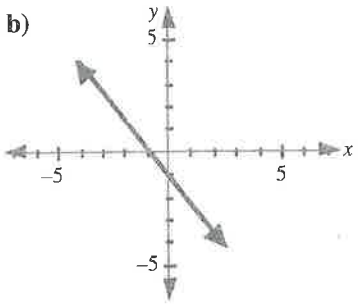


2. State the domain and range for each relation.

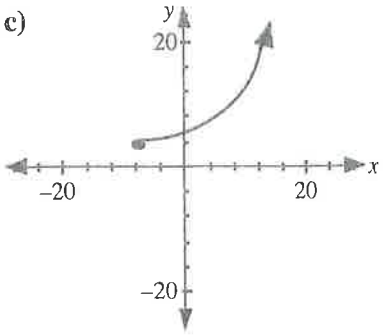
a)



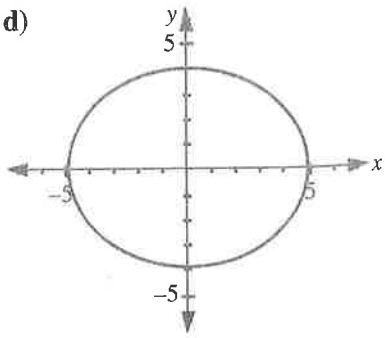
b)



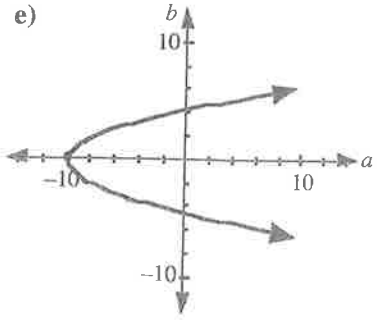
c)



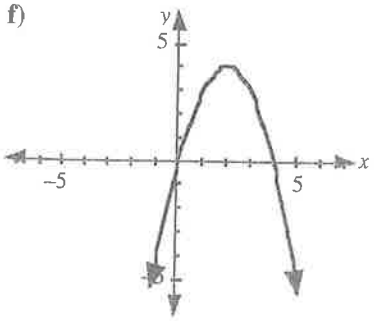
d)



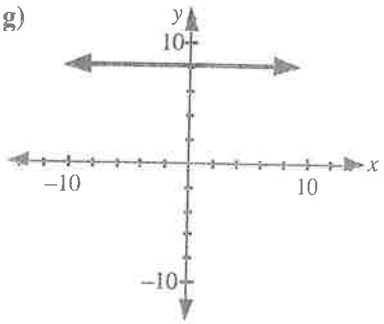
e)



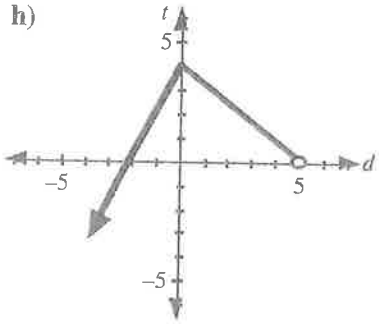
f)



g)



h)



3. In each case a relation is graphed on a grid. State the domain and range of the relation if the graph is

a) a circle whose centre is located at $(-1, 12)$ and has a radius of 5 units.

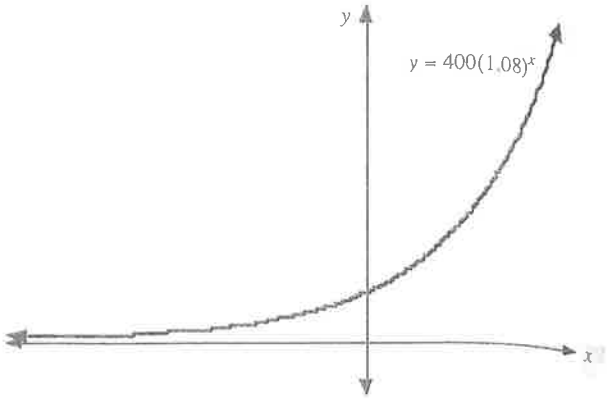
b) a circle with centre $(-3, -5)$ and diameter 40 units.

c) a rectangle with vertices $A(-8, 10)$, $B(-8, -2)$, $C(7, -2)$, and $D(7, 10)$.

d) a triangle with vertices $T(-50, -75)$, $U(-35, -25)$, and $V(-65, -25)$.

4. The graph of the relation $y = 400(1.08)^x$ is shown on the grid.

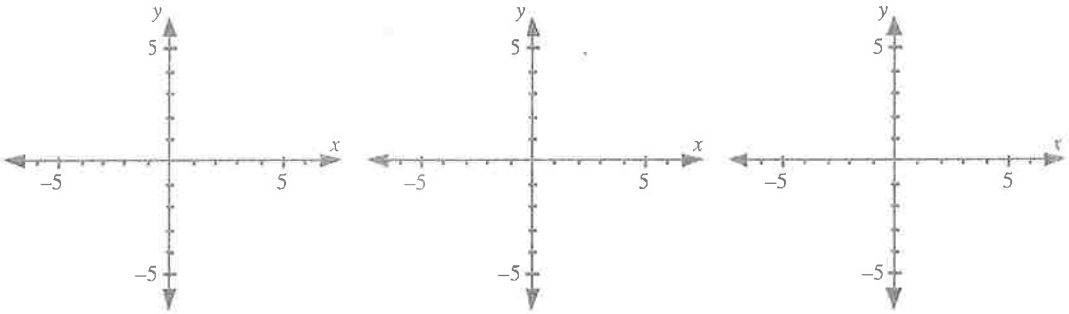
a) State the domain, range, and y-intercept of the relation.



b) The relation $A = 400(1.08)^t$ represents the amount of money when an original investment of \$400 is compounded annually at 8% for a period of t years. State the domain and range of this relation, and explain why the answer is different from a).

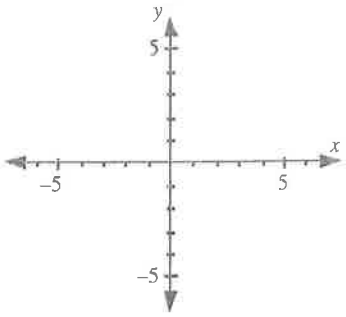
5. In each case draw a graph on the domain of real numbers which could represent a linear relation with

a) one x-intercept **b)** no x-intercept **c)** an infinite number of x-intercepts.

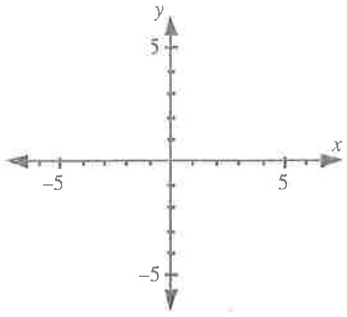


6. In each case draw a graph of a non linear relation with

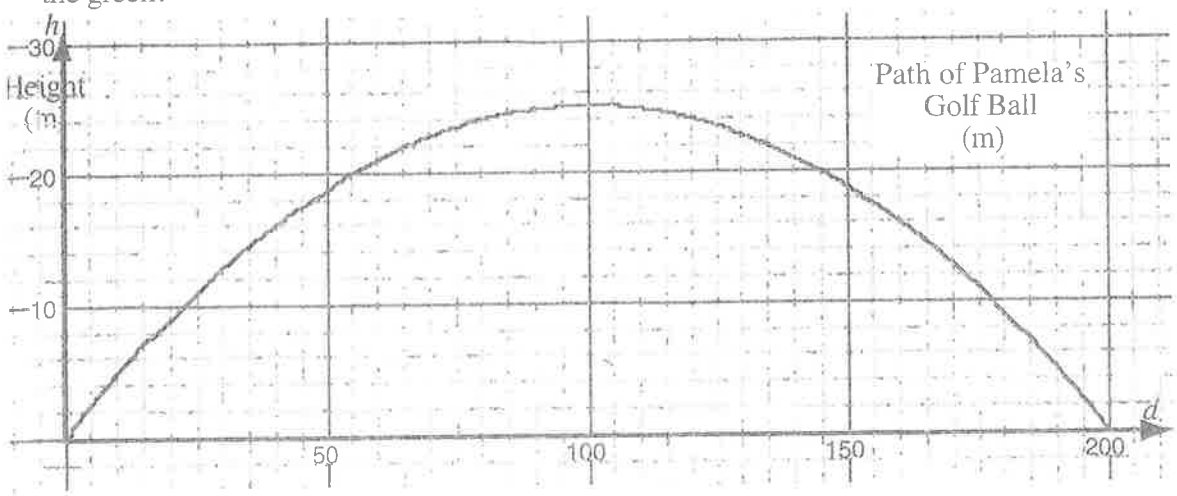
a) domain $x \in R$, range $y \geq -3, y \in R$ two x-intercepts and one -intercept



b) domain $x \in R$, range $y \geq -3, y \in R$ one x-intercept and one y-intercept.



7. The graph shows the flight of Pamela's golf ball from the tee to a sand trap at the edge of the green.



a) State the h-intercept and the d-intercepts of the graph, and explain their significance in relation to the question.

b) State the maximum height of the golf ball, and explain its relevance to the domain or range of the relation.

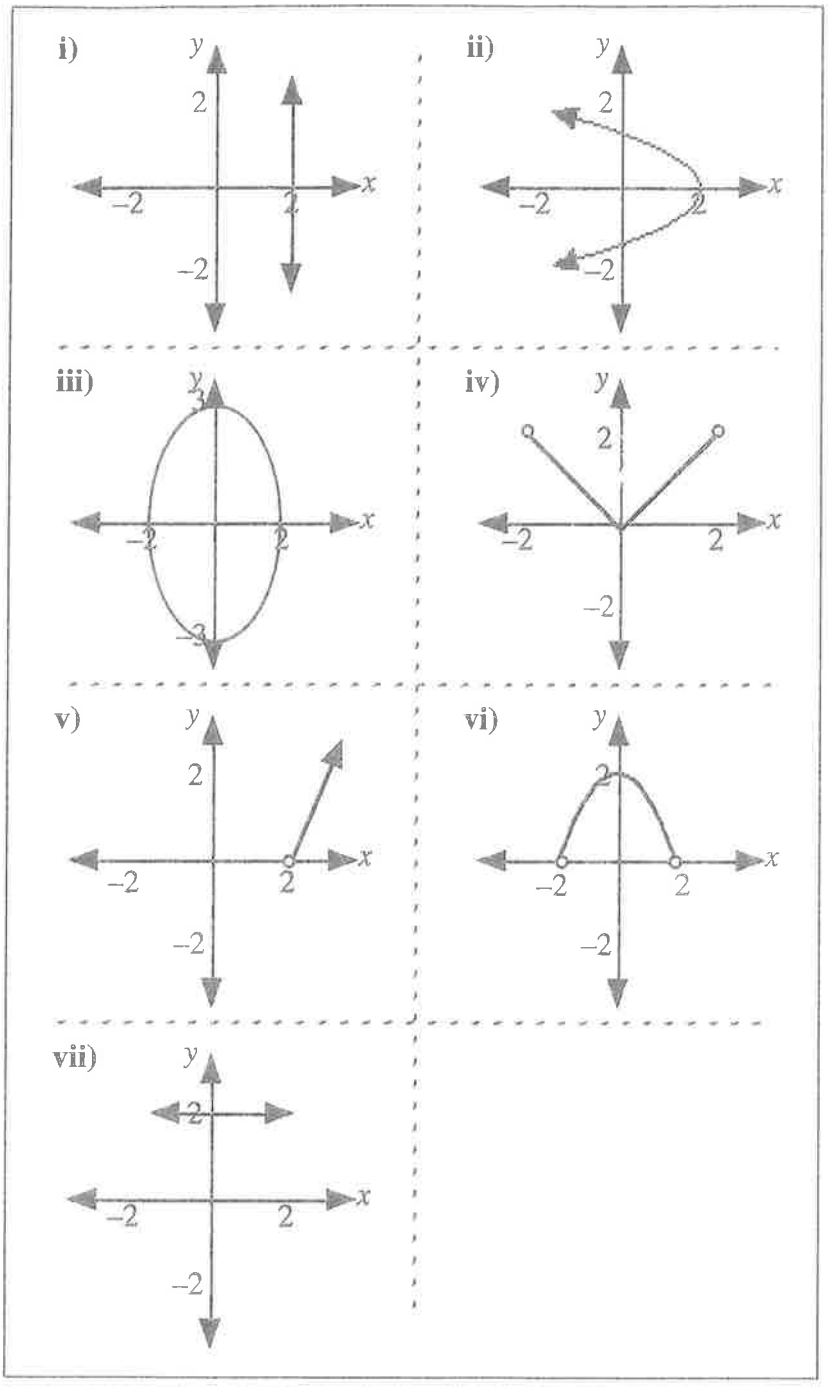
c) State the domain and range of the relation.

d) Estimate from the graph the horizontal distance the ball has travelled when it is 20 m in the air. Explain why there are two answers.

e) Estimate from the graph the height of the golf ball when the horizontal distance from the tee is 80 m.

f) Give a brief description of the relationship between the height of the golf ball and the horizontal distance from the tee.

8. Match each graph with the domain from A to F. Each domain may be used once, more than once, or not at all.



A. $x = 2$

B. $x < 2$

C. $x \leq 2$

D. $x > 2$

E. $x \geq 2$

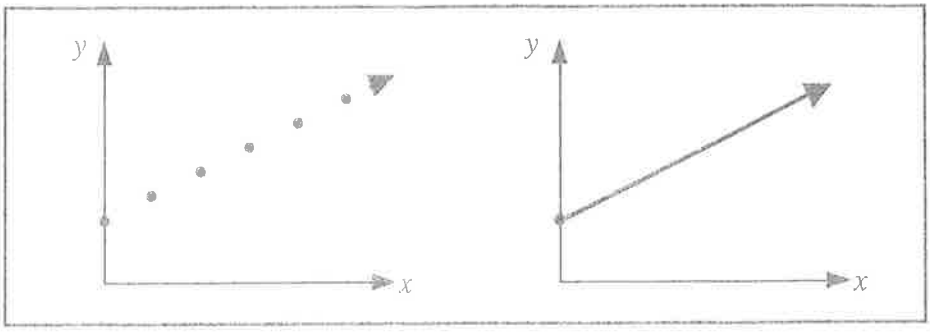
F. $-2 < x < 2$

G. $-2 \leq x \leq 2$

H. $2 < x < -2$

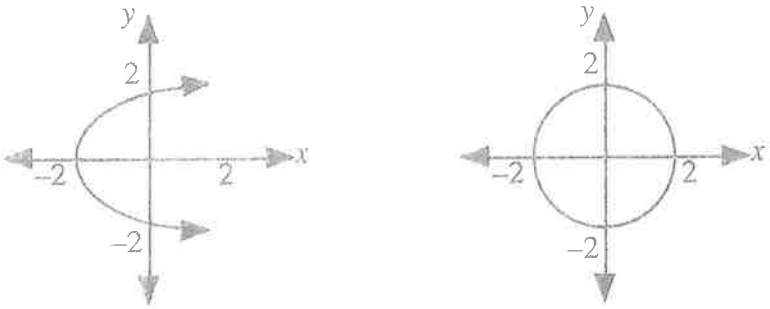
I. $x \in R$

9. The graphs of two relations are shown. Which of the following statements is true?



A. The domains are the same, but the ranges are different.
B. The ranges are the same, but the domains are different.
C. The domains are the same, and the ranges are the same.
D. The domains are different, and the ranges are different.

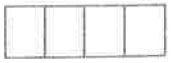
10. The graphs of two relations are shown. Which of the following statements is true?



A. The range of each relation is $-2 \le y \le 2$.
B. The range of each relation is $y \in R$.
C. The domain of each relation is $-2 \le x \le 2$.
D. None of the above.

11. The relation between the distance travelled, d km, and the cost, C dollars, of renting a truck is given by the formula $C = 60 + 0.27d$. The domain of the relation can be expressed in the form $d \ge x$, and the range can be expressed in the form $C \ge y$. Write the value of y in the first two boxes and the value of x in the last two boxes.

(Record your answer in the numerical response box from left to right)



Assignment

1. State the domain and range of each relation.

a) (2,3), (0,2), (4,8), (–1,8), (–3,1)

domain : {2, 0, 4, -1, 3}
range : {3, 2, 8, 1}

b) (–3,3), (0,–5), (–3,3), (5,–2), (–8,1)

domain : {-3, 0, 5, -8}
range : {3, -5, -2, 1}

c)

Input (x)	Output (y)
0	3
2	4
4	5
6	3

domain: {0, 2, 4, 6}
range : {3, 4, 5}

d)

Input (x)	Output (y)
2	3
0	4
–3	5
2	6

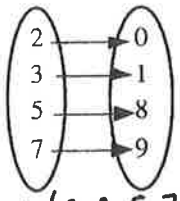
domain: {2, 0, -3}
range: {3, 4, 5, 6}

e)

Input (x)	Output (y)
1	5
–1	5
3	5
7	5

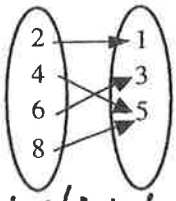
domain : {1, -1, 3, 7}
range : { 5 }

f)



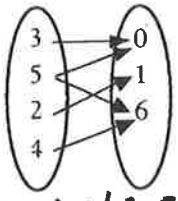
domain : {2, 3, 5, 7}
range : {0, 1, 8, 9}

g)



domain : {2, 4, 6, 8}
range : {1, 3, 5}

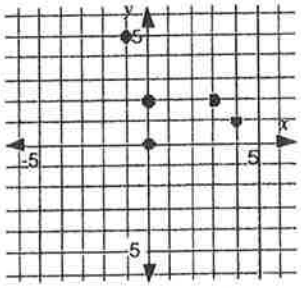
h)



domain : {3, 5, 2, 4}
range: {0, 1, 6}

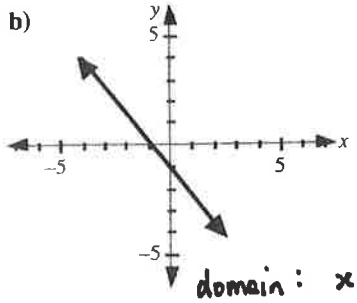
2. State the domain and range for each relation.

a)



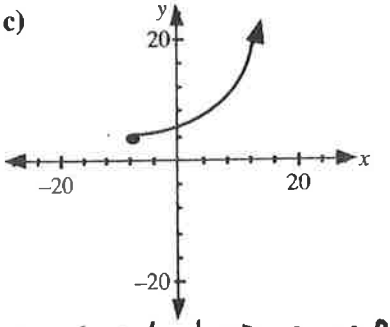
domain : {-1, 0, 3, 4}
range : {5, 0, 2, 1}

b)



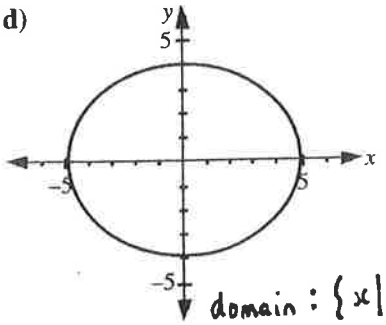
domain : $x \in R$
range : $y \in R$

c)



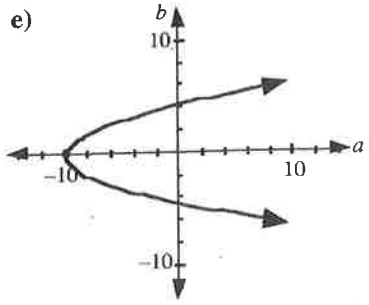
domain : $\{x \mid x \geq -8, x \in R\}$
range : $\{y \mid y \geq 4, y \in R\}$

d)



domain : $\{x \mid -5 \leq x \leq 5, x \in R\}$
range : $\{y \mid -4 \leq y \leq 4, y \in R\}$

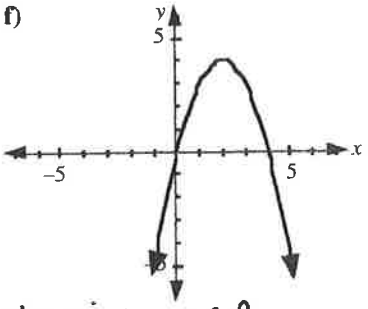
e)



domain : $\{a \mid a \geq -10, a \in R\}$

range : $b \in R$

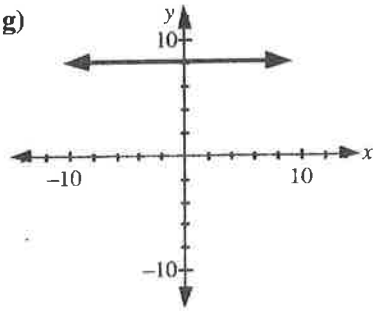
f)



domain : $x \in R$

range : $\{y \mid y \leq 4, y \in R\}$

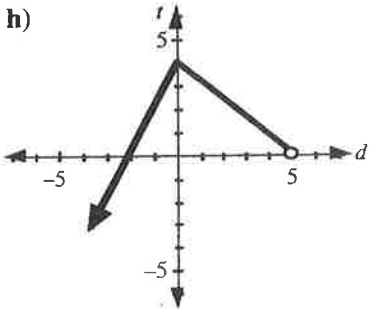
g)



domain : $x \in R$

range : $y = 8$

h)

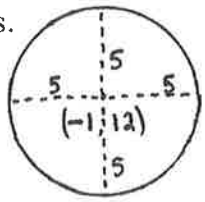


domain : $\{d \mid d < 5, d \in R\}$

range : $\{t \mid t \leq 4, t \in R\}$

3. In each case a relation is graphed on a grid. State the domain and range of the relation if the graph is

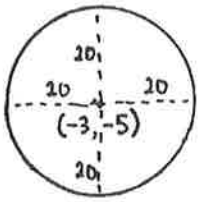
a) a circle whose centre is located at $(-1, 12)$ and has a radius of 5 units.



domain : $\{x \mid -6 \leq x \leq 4, x \in R\}$

range : $\{y \mid 7 \leq y \leq 17, y \in R\}$

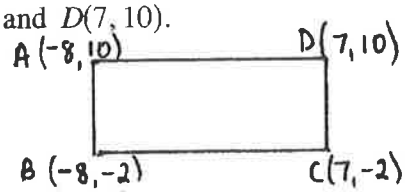
b) a circle with centre $(-3, -5)$ and diameter 40 units.



domain : $\{x \mid -23 \leq x \leq 17, x \in R\}$

range : $\{y \mid -25 \leq y \leq 15, y \in R\}$

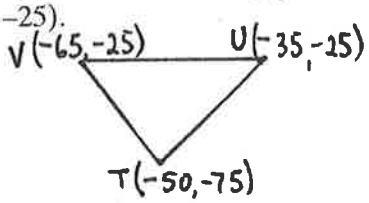
c) a rectangle with vertices $A(-8, 10)$, $B(-8, -2)$, $C(7, -2)$, and $D(7, 10)$.



domain : $\{x \mid -8 \leq x \leq 7, x \in R\}$

range : $\{y \mid -2 \leq y \leq 10, y \in R\}$

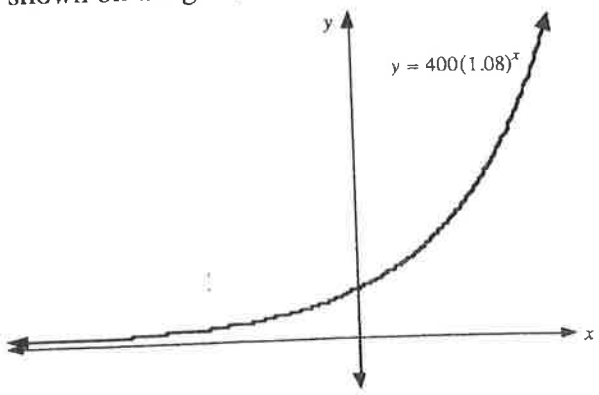
d) a triangle with vertices $T(-50, -75)$, $U(-35, -25)$, and $V(-65, -25)$.



domain : $\{x \mid -65 \leq x \leq -35, x \in R\}$

range : $\{y \mid -75 \leq y \leq -25, y \in R\}$

4. The graph of the relation $y = 400(1.08)^x$ is shown on the grid.



a) State the domain, range, and y-intercept of the relation.

domain $x \in R$

range $\{y \mid y > 0, y \in R\}$

y-int. $x = 0$

$y = 400(1.08)^0 = 400$

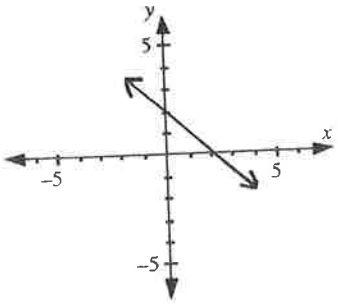
b) The relation $A = 400(1.08)^t$ represents the amount of money when an original investment of \$400 is compounded annually at 8% for a period of t years. State the domain and range of this relation, and explain why the answer is different from a).

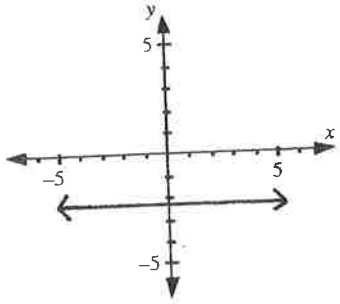
domain $\{t \mid t \geq 0, t \in R\}$ different from a) because time is not negative.

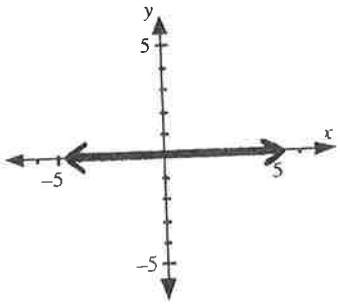
range $\{A \mid A \geq 400, A \in R\}$ different from a) because the amount of money is never less than \$400

5. In each case draw a graph on the domain of real numbers which could represent a linear relation with

a) one x-intercept **b)** no x-intercept **c)** an infinite number of x-intercepts.

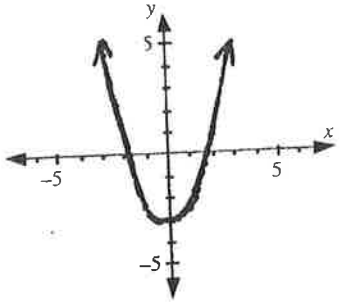




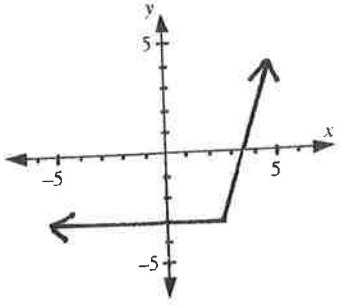


6. In each case draw a graph of a non linear relation with

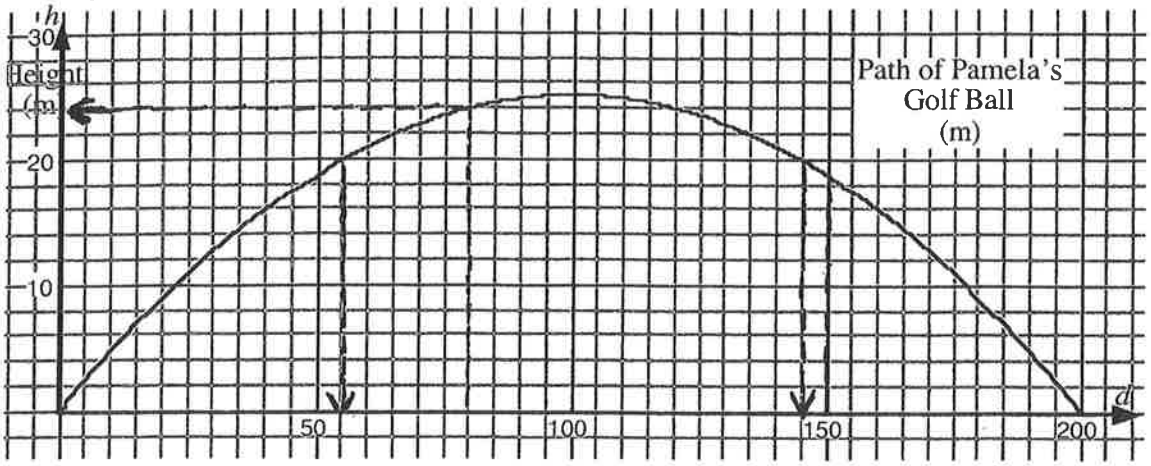
a) domain $x \in R$, range $y \geq -3, y \in R$ two x-intercepts and one -intercept



b) domain $x \in R$, range $y \geq -3, y \in R$ one x-intercept and one y-intercept.



7. The graph shows the flight of Pamela's golf ball from the tee to a sand trap at the edge of the green.



a) State the h-intercept and the d-intercepts of the graph, and explain their significance in relation to the question.

h-intercept = 0

d-intercepts = 0 and 200

On the tee the ball is on the ground. It returns to ground level 200 m from the tee.

b) State the maximum height of the golf ball, and explain its relevance to the domain or range of the relation.

The maximum height = 25 m. It represents the upper limit of the range.

c) State the domain and range of the relation.

domain: $\{d \mid 0 \leq d \leq 200,\ d \in R\}$

range: $\{h \mid 0 \leq h \leq 25,\ h \in R\}$

d) Estimate from the graph the horizontal distance the ball has travelled when it is 20 m in the air. Explain why there are two answers.

55 m from the tee when the ball is rising and 145 m from the tee when the ball is descending.

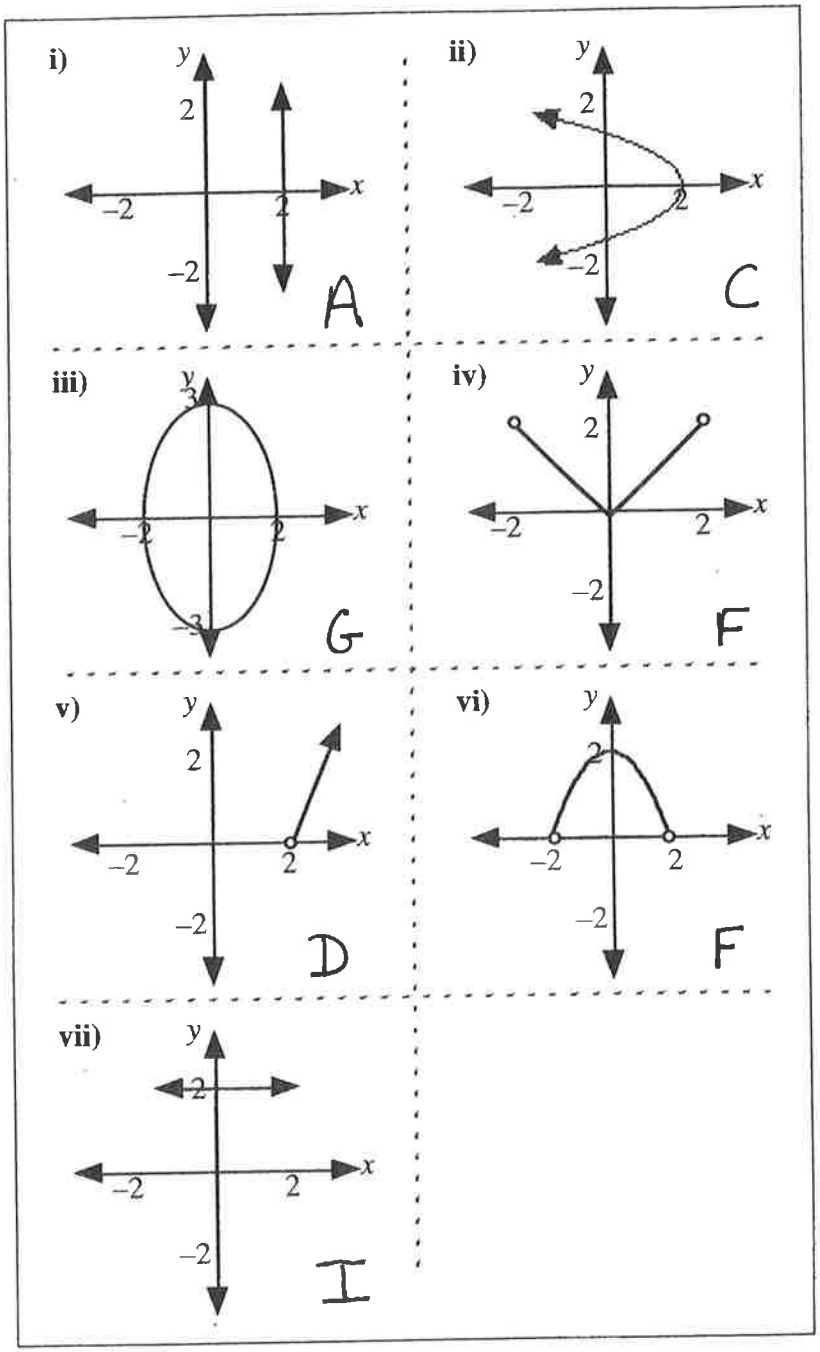
e) Estimate from the graph the height of the golf ball when the horizontal distance from the tee is 80 m.

24 m

f) Give a brief description of the relationship between the height of the golf ball and the horizontal distance from the tee.

Starting from a height of 0 m at the tee, the golf ball increases in height to a maximum height of 25 m, 100 m from the tee. Then the golf ball starts decreasing in height until it hits the ground 200 m from the tee.

8. Match each graph with the domain from A to F. Each domain may be used once, more than once, or not at all.



A. $x = 2$

B. $x < 2$

C. $x \leq 2$

D. $x > 2$

E. $x \geq 2$

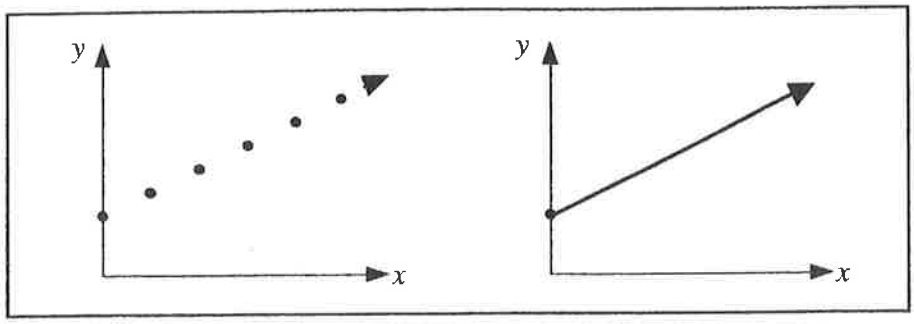
F. $-2 < x < 2$

G. $-2 \leq x \leq 2$

H. $2 < x < -2$

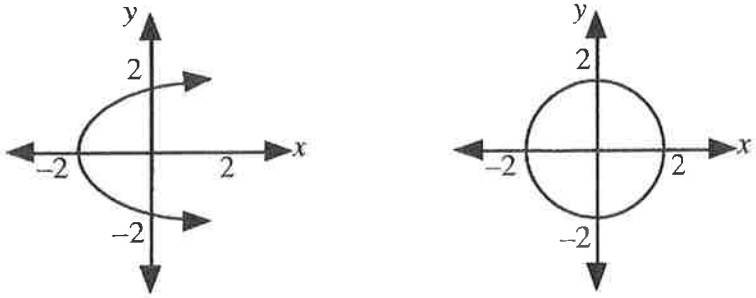
I. $x \in R$

Multiple Choice **9.** The graphs of two relations are shown. Which of the following statements is true?



A. The domains are the same, but the ranges are different.
B. The ranges are the same, but the domains are different.
C. The domains are the same, and the ranges are the same.
D. The domains are different, and the ranges are different.

10. The graphs of two relations are shown. Which of the following statements is true?



A. The range of each relation is $-2 \le y \le 2$. ✗
B. The range of each relation is $y \in R$. ✗
C. The domain of each relation is $-2 \le x \le 2$. ✗
D. None of the above.

Numerical Response **11.** The relation between the distance travelled, d km, and the cost, C dollars, of renting a truck is given by the formula $C = 60 + 0.27d$. The domain of the relation can be expressed in the form $d \ge x$, and the range can be expressed in the form $C \ge y$. Write the value of y in the first two boxes and the value of x in the last two boxes.

(Record your answer in the numerical response box from left to right)

6	0	0	0

domain $d \ge 0$
range $C \ge 60$

Answer Key

1. **a)** $D = \{2, 0, 4, -1, -3\}$ $R = \{3, 2, 8, 1\}$ **b)** $D = \{-3, 0, 5, -8\}$ $R = \{3, -5, -2, 1\}$ **c)** $D = \{0, 2, 4, 6\}$ $R = \{3, 4, 5\}$ **d)** $D = \{2, 0, -3\}$ $R = \{3, 4, 5, 6\}$
e) $D = \{1, -1, 3, 7\}$ $R = \{5\}$ **f)** $D = \{2, 3, 5, 7\}$ $R = \{0, 1, 8, 9\}$ **g)** $D = \{2, 4, 6, 8\}$ $R = \{1, 3, 5\}$ **h)** $D = \{3, 5, 2, 4\}$ $R = \{0, 1, 6\}$

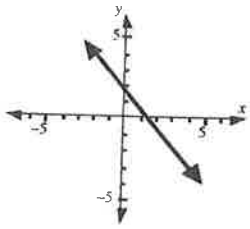
2. **a)** $D = \{-1, 0, 3, 4\}$ $R = \{5, 0, 2, 1\}$ **b)** $D = \{x \in R\}$ $R = \{y \in R\}$ **c)** $D = \{x \geq -8, x \in R\}$ $R = \{y \geq 4, y \in R\}$ **d)** $D = \{-5 \leq x \leq 5, x \in R\}$ $R = \{-4 \leq y \leq 4, y \in R\}$
e) $D = \{a \geq -10, a \in R\}$ $R = \{b \in R\}$ **f)** $D = \{x \in R\}$ $R = \{y \leq 4, y \in R\}$ **g)** $D = \{x \in R\}$ $R = \{8\}$ **h)** $D = \{d < 5, d \in R\}$ $R = \{t \leq 4, t \in R\}$

3. **a)** $D = \{-6 \leq x \leq 4, x \in R\}$ $R = \{7 \leq y \leq 17, y \in R\}$ **b)** $D = \{-23 \leq x \leq 17, x \in R\}$ $R = \{-25 \leq y \leq 15, y \in R\}$
c) $D = \{-8 \leq x \leq 7, x \in R\}$ $R = \{-2 \leq y \leq 10, y \in R\}$ **d)** $D = \{-65 \leq x \leq -35, x \in R\}$ $R = \{-75 \leq y \leq -25, y \in R\}$

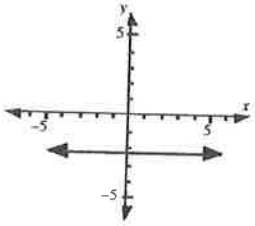
4. **a)** $D = \{x \in R\}$ $R = \{y > 0, y \in R\}$, y–int is 400
b) $D = \{t \geq 0, t \in R\}$ different from a) because time is never a negative value.
$R = \{A \geq 400, A \in R\}$ different from a) because the amount of money can never be less than \$400.

5. Answers may vary.

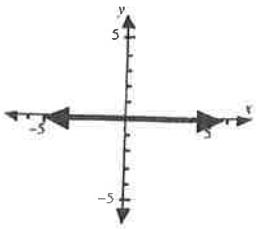
a)



b)

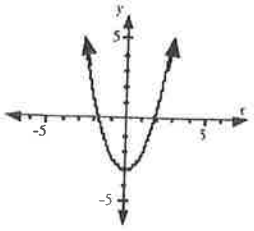


c)

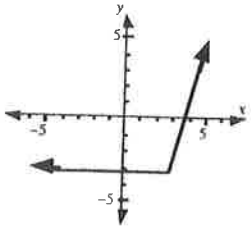


6. Answers may vary.

a)



b)



7. **a)** h–int = 0, d–int = 0 and 200. On the tee the ball is on the ground. It returns to ground level 200 m from the tee.
b) max height = 25 m. The maximum height is the upper limit of the range.
c) $D = \{0 \leq d \leq 200, d \in R\}$ $R = \{0 \leq h \leq 25, h \in R\}$
d) 55 m from the tee when the ball is rising and 145m from the tee when the ball is descending.
e) 24 m
f) Starting from a height of 0 m at the tee, the golf ball increases in height to a maximum height of 25m, 100 m from the tee. Then the golf ball starts decreasing in height until it hits the ground 200 m from the tee.

8. **i)** A **ii)** C **iii)** G **iv)** F **v)** D **vi)** F **vii)** I

9. D **10.** D **11.**

6	0	0	0